

# GNG1106 Fall 2017 - Assignment 1

**Available: Sept 5**

**Due: Sept 24, 11:59pm**

## Instructions

This assignment is to be done INDIVIDUALLY. Use the following instructions to complete and submit this assignment:

- You will need to submit your assignment electronically to Brightspace. Prepare the following:
  - An assignment file in PDF format (this allows you to use your favorite editor to create the PDF file). For question 1, insert the programming models for parts (a) and (b) filled in as per the question instructions. You may fill in the programming model using drawing features of your editor or by hand on paper which is then scanned and inserted into your document (be sure that the hand drawn diagram is legible). For Questions 2 and 3, insert in your assignment file the source code (take care in its appearance), and capture the output from running the program for all test cases. Also submit your **source code** files for questions 2 and 3.
- Place all your files (PDF file and C source code files) in a directory A1\_xxxxxxx where xxxxxxx is your student number.
- Zip your PDF document and the C source files in a zip file with the name A1\_xxxxxx.zip where xxxxxx is your student number.
- Submit the zip file before the assignment deadline via Brightspace. In Brightspace, navigate to the Assignment page and click on “Click to submit Assignment 1” to reach the assignment 1 submission folder. You can also select the Assignment tab to see the Assignment folder pages. The Brightspace video “Assignments” (found in the page <https://tlss.uottawa.ca/site/en/connection-to-the-lms#video-tutorials>) provides details to help you submit the zip file.
- The questions are provided in both PDF and Word files. You may use the Word file to enter your answers in the document. An rtf file is also provided so that you may edit the file with a word processor other than Word. Be sure to submit a **PDF** file.
- It is NOT permitted to use instructions such as branches and loops that have not yet been covered in the lectures.
- Do start the assignment soon and do **not** wait until the last minute. You will be more efficient with a number of smaller efforts over a few weeks before the deadline than one large effort just before the deadline.

## Marking Scheme (total 20 marks)

- Question 1: 10 marks
- Question 2: 10 marks
- Question 3: 15 marks

### Question 1 (10 marks)

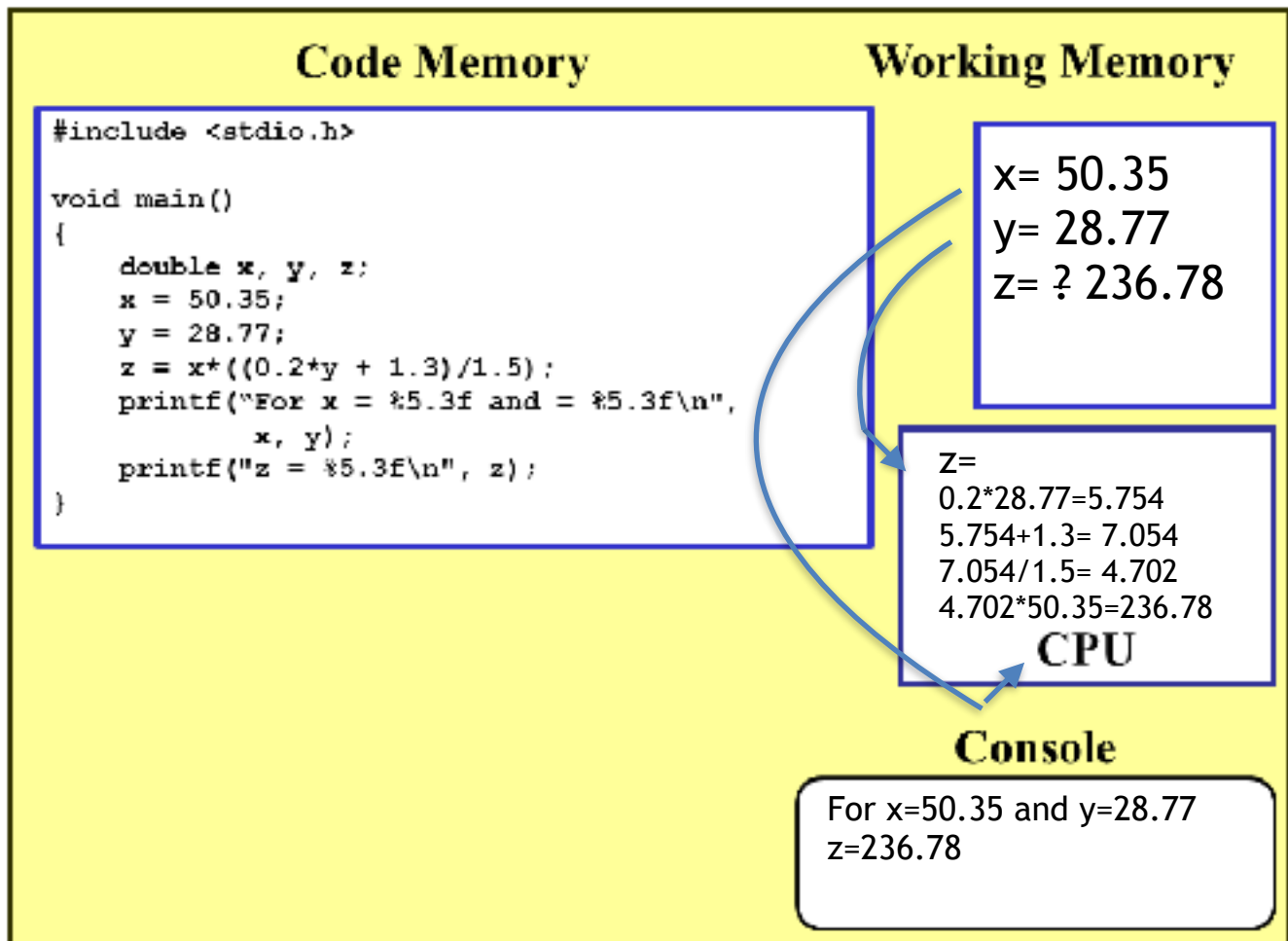
- a) (5 marks) The following programming model contains the indicated C program in its code memory. You will be showing how the working memory is used during the execution of this program and how the CPU evaluates the arithmetic expression that assigns a value to the variable **u**.

Show the variables created in the working memory and how their values change during the execution of the program.

- Show the values are assigned to the variables. Be sure to show all values that are assigned and replaced. Record successive assignments to variables/parameters as follows:

**Variable** ~~7~~ ~~2~~ ~~6~~ ~~4~~ 10

- For the operation, show how contents from the working memory are moved to the CPU to calculate the value assigned to variable u. Show the results of **all** operations carried out in the CPU, that is, **one line** per operation.
- Finally show the output of the program in the console window.



- b) (5 marks) The following programming model contains in its code memory the indicated C program composed of 2 functions. You will be showing how the working memory is used during the execution of the two functions. Each piece of working memory is associated to a function using a pair of lines. (Note: the first pair of lines associates the piece of working memory allocated to the function **main** and the second pair of lines associates the piece allocated to the function **fxxy**).

Show how the variables (and parameters) are created in each piece of working memory during the execution of the functions. It is **not** necessary to show how the operations are carried out in the CPU as in the case of part (a).

- Show the values are assigned to the variables. Be sure to show all values that are assigned and replaced. Record successive assignments to variables/parameters as follows:

**Variable**  $\cancel{7}/\cancel{2}/\cancel{6}/\cancel{4}/10$

- Using arrows show how values are copied between the working memory allocated to the function **main** and the working memory allocated to the function **fxxy**.
- Finally show the output of the program in the console window.

